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PROCEEDINGS
OF THE
AMERICAN PHILOSOPHICAL SOCIETY,
HELD AT PHILADELPHIA, FOR PROMOTING USEFUL KNOWLEDGE.

VOL. XXXVII.

JANUARY, 1898.

No. 157.

Stated Meeting, January 7, 1898.

Dr. J. C. MORRIS in the Chair.

Present, 17 members.

Dr. T. J. J. See and Mr. Sydney Geo. Fisher, newly elected members, were presented to the Chair and took their seats.

Acknowledgments of election to membership were read from Messrs. Charles De Garmo, Arnold E. Ortmann, Thomas J. J. See, Alden Sampson, Sydney George Fisher, Benjamin Kendall Emerson, Francis L. Patton, Edward S. Holden, and Ethelbert Dudley Warfield.

An invitation was received from the Academy of Natural Sciences of Philadelphia, to participate in a memorial meeting commemorative of Harrison Allen, M.D., and George H. Horn, M.D., to be held at the Academy on December 31, at 8 o'clock.

The Judges and Tellers of the annual election reported the following officers elected for the ensuing year :

President.

Frederick Fraley.

Vice-Presidents.

E. Otis Kendall, William Pepper, Coleman Sellers.

Secretaries.

Persifer Frazer, I. Minis Hays, Frederick Prime,
S. P. Sadtler.

Curators.

J. Cheston Morris, Benjamin Smith Lyman, Henry Pettit.

Treasurer.

Horace Jayne.

Councillors for three years.

Henry C. Baird, Isaac J. Wistar, Jacob M. DaCosta.

Councillor for one year, to fill an unexpired term.

George F. Edmunds.

Dr. I. Minis Hays was nominated for Librarian for the ensuing year.

Prof. Cleveland Abbe read a paper on "The Accepted Altitude of the Aurora Borealis."

Mr. Sachse and Mr. Cook offered some remarks in discussion.

Dr. T. J. J. See presented a paper for the *Transactions* on "The Evolution of the Stellar Systems," which was discussed by Prof. Doolittle, Prof. Snyder, Dr. See and Prof. Abbe.

The Society was adjourned by the presiding member.

THE ALTITUDE OF THE AURORA ABOVE THE EARTH'S SURFACE.

BY CLEVELAND ABBE.

(Read January 7, 1898.)

During the past three centuries numerous observers and physicists, astronomers and magneticians have endeavored to contribute to our knowledge of the altitude of the region whence the auroral light proceeds, and still the greatest diversity of opinion seems to prevail on this subject. Some observers have seen the light in such positions between themselves and neighboring objects as to demonstrate that the aurora, like the lightning, descends to the very surface of the earth and may even be entirely confined to the lowest stratum: prominent among these are Captain Parry, Sir James Clark Ross and Sir John Ross, his uncle, Dr. Walker and Prof. J. P. Lesley.

Others, such as Dr. Richardson, Sir John Franklin, Silbermann, have seen it so located among the clouds that its origin must be placed at or below their level and, therefore, within a few thousand feet of the earth's surface. On the other hand, those who have calcu-